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ARCHIVES OF PEDIATRICS

A MONTHLY DEVOTED TO THE

DISEASES OF INFANTS AND CHILDREN

JOHN FITCH LANDON, M.D., Editor

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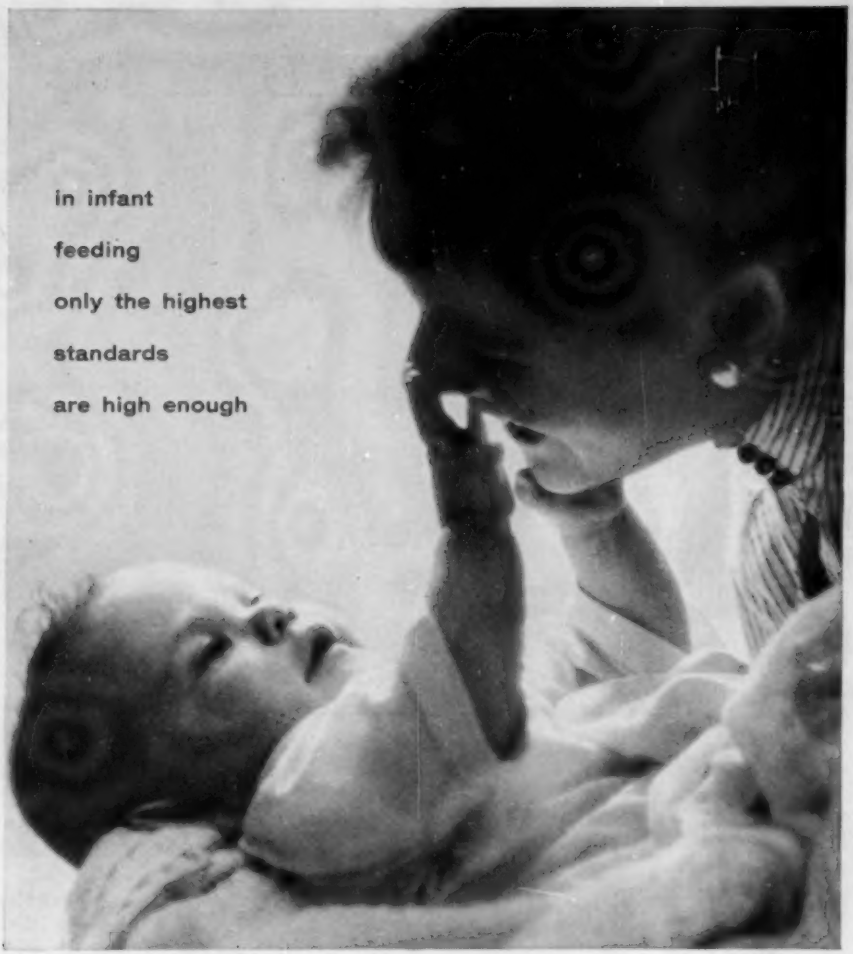

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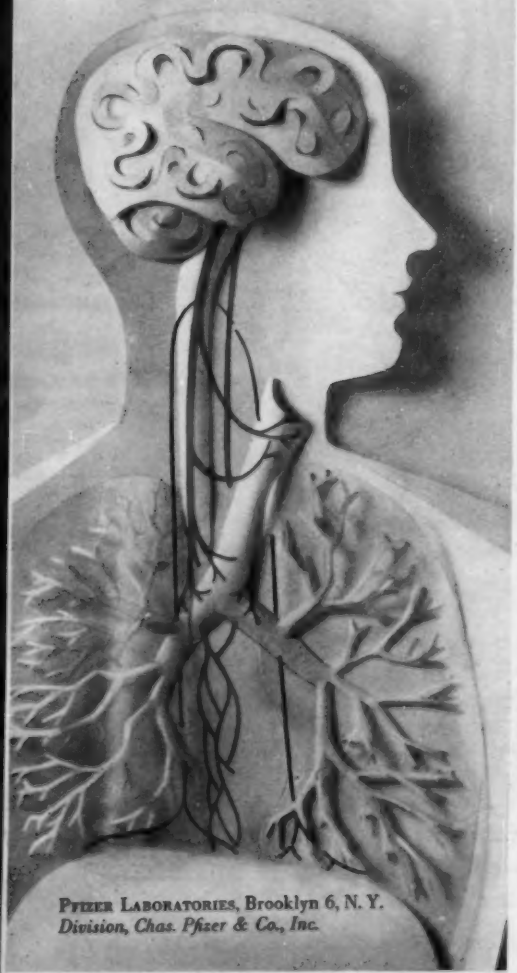

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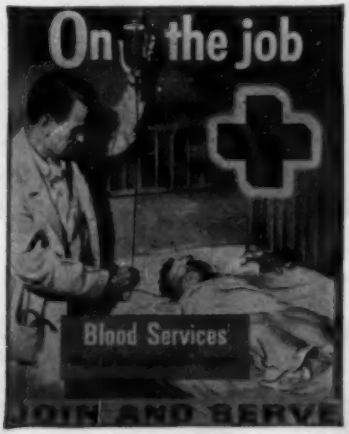

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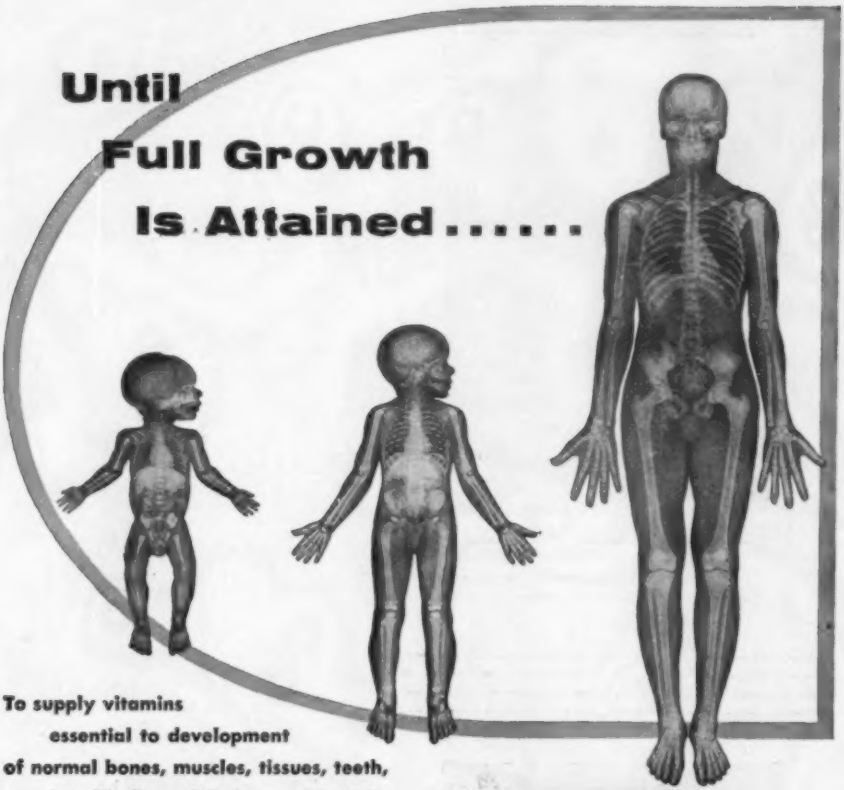

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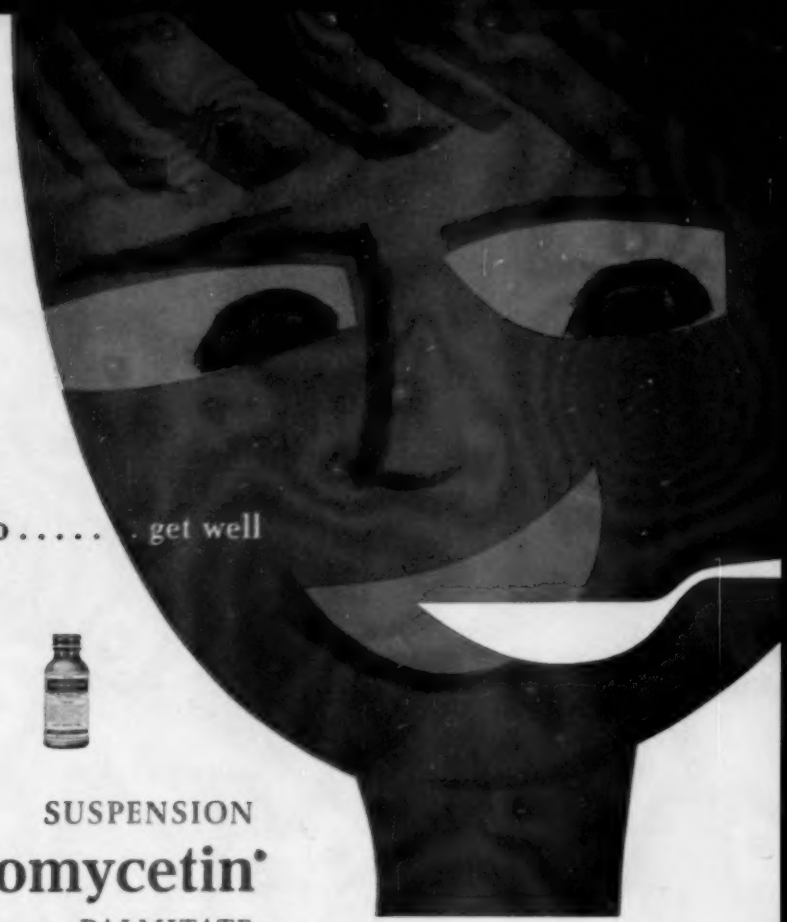

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PSYCHIATRIC ASPECTS OF HOSPITALIZING CHILDREN*

A. H. CHAPMAN, M.D.

DOROTHY G. LOEB, M.A.

AND

MARY JANE GIBBONS, M.S.S.W.

Kansas City, Mo.

Beverly, writing in 1936,[1] pointed out the rarity of observations in medical literature at that time on the emotional aspects of hospitalized children. In the two decades since then, an extensive literature[2,3,4,5] has appeared on this subject. The emotional reactions of children to hospitalization, surgery and prolonged convalescence have been investigated and reported. Relatively little of this material is published in the literature which is customarily presented to the medical profession. Most of such data is recorded in psychiatric specialty journals, psychology periodicals, and social work and mental hygiene monographs and publications. It is paradoxical that, with a few notable exceptions, very little of this work is systematically presented to the persons most crucial in the hospital care of children, the practicing pediatrician and the family doctor.

The authors, working in a 130-bed pediatric hospital and primarily active in teaching and consultation services to physicians, are very much aware of this problem. It stems from lack of contact between the psychiatric specialist and his colleague in pediatric practice; it reflects the quite human inclination to publish data

*From the Psychiatric Unit, The Children's Mercy Hospital, Kansas City, Mo. affiliated with the Greater Kansas City Mental Health Foundation and the Department of Pediatrics of the University of Kansas School of Medicine.

on one's own specialty where confreres will see it. It is also partially due to the fact that much of this work has been done by psychiatrist-psychologist-social worker teams who tend to publish in non-medical journals.

There is an obvious, but rarely defined tendency to treat the hospitalized child in a manner similar to the hospitalized adult. Both adult and child are separated from the family, placed in an unfamiliar environment, and subjected to a variety of diagnostic and therapeutic procedures whose nature they only partially understand. The adult tolerates this relatively well because he knows (a) these procedures are intended to help him; (b) he realizes he is sick and needs help; (c) he has some understanding of the purpose of a hospital and the roles of physicians and hospital personnel; (d) he realizes that the pain of a procedure, such as a venapuncture, is a brief, kindly-intended act to help him medically; (e) he understands that he is only temporarily and partially separated from his loved ones, such as wife, children and others; (f) he has a clear concept as to how long this may last, and he knows that he has the power to leave, if need be, and to dismiss the people who are in attendance on him if he feels he has reason to do so. To the child, little or none of this may be clear; yet, his handling by hospital procedures and rules is little different from that of the adult.

In comparison, to the child hospitalization may mean quite different things: (a) he may not comprehend the procedures, whether they are designed to help or hurt him, or why they are done at all; (b) he may have no clear concept as to how sick he is or what relevance this might have to his illness; (c) he may not have any understanding of a hospital—to him doctors and nurses are strangers and the hospital is a strange, meaningless, often frightening place; (d) the pain of diagnostic procedures may mean only the whims or designs of his captors; (e) he may not have any time concept, whether this is a temporary or permanent isolation, and/or abandonment by his family; (f) he may feel that he is powerless to terminate this, to get away from the people around him, or to protect himself from their activities if he thinks they are inimical to him. Naturally, the degree of reaction varies with the age of the child; the younger the child, the more alarming the situation will seem. To complicate matters even more, the procedure would be alarming to a well child, how

much more then when used on a sick child, who is already physically incapacitated, to a degree, in his ability to cope with the stresses of his environment. If anyone doubts this, he need but listen to the crying and wailing which is the familiar and usual auditory milieu on a pediatric receiving ward for children under the age of five. To a lesser degree, it is also true of children in older age-groups.

There is a large literature[6,7,8,9] to validate these points. Brief consideration would tend to make them seem obvious, but the obvious confronts us so bluntly that it is often the last thing subjected to critical survey or scientific scrutiny. Lest the reader feel that we are brewing a tempest in a test-tube, he is referred to the work of Spitz, Ribble, Bowlby, Jackson and many others who have studied hospitalized children in many settings, and who have all come basically to similar conclusions. Their conclusions are that hospitalization, preparation for surgery, and prolonged illness are often emotionally damaging, frightening procedures to children, and they may have transitory or lasting effects on emotional functioning and personality development. The problem, simply stated, is that the child, whose emotional maturity is embryonic, and whose comprehension and grasp of reality are still imperfect, is treated by hospital routines as though he were a mature adult.

In any introduction to this problem it is important to realize the great significance of fantasy (conscious and unconscious daydreaming) activity in children. At birth, the child has, of course, no concept of reality of the world around him. Concepts of reality are slowly and with difficulty only carved out of the stimuli which bombard him each waking moment. But the space which reality gradually fills as the years of childhood pass, though a void at birth, does not remain so. Until displaced by accumulating reality concepts, it is filled by a diffuse panorama of fantasies, daydreams and grotesque partial distortions of reality. Only after several years of life, in all probability, does objective reality play a more important role than fantasy. To the child of three, an intern with a venapuncture needle may be more a tormenting demon than a kindly physician.

Communication with people, verbally as well as by facial expression and gestures, probably does not become more important

than fantasy until about the age of seven.[10] Until that age, the words and the attitudes of people are seen only through the cloudy, colored glasses of the child's florid fantasy life. It takes a child years to develop clear concepts as to what "mother" and "father" are, let alone what "hospital," "doctor," and "tonsillectomy" are. But until these clear reality concepts do develop, their space is filled by fantastic impressions which are equally realistic and pressing to the child.

Being separated from family, going to a hospital and being operated on, may be terrifying experiences which now become more intelligible. To a child going to a hospital may mean abandonment and rejection by family; surgical operation may mean wanton physical assault; venapuncture may mean casual sadism of the most frightening kind. These broad statements become statistical facts in the long and intensive studies of Jessner, Bowlby, Spitz and others.

The child who enters a hospital is often provided with only fragmentary information. He may be told nothing, even grossly deceived; some parents even threaten children with hospitalization as a disciplinary technique. Hospitalization is a difficult experience for the well-prepared child; it may be devastating to the poorly-prepared child.

To the child who already has been emotionally damaged in previous interpersonal relationships, hospitalization becomes a specific threat. The child, who has grave anxieties about the attitude of a cold, rejecting mother will feel hospitalization as the climactic rejection and abandonment he has long feared. The child who has dreaded the callous brutality of a father, who had not wanted the pregnancy that produced him, may consider the penicillin injections by the nurse as further cruelty by an agent of the father. The more dependent, shy and isolated a child is, the more threatening hospitalization will be to him. The fears and dreadful fantasies of emotionally damaged children may assume indefinite, variable forms. In this paper, it should be clearly stated, we are concerned mainly with the effects of hospitalization on emotionally normal children. To the child who is already emotionally damaged, hospitalization may be an even more upsetting and traumatic experience; particular attention and special reassurances and explanations are needed.

Two brief case reports will illustrate some of these points clinically:

Case 1. This 15-year-old boy was admitted to the hospital with a presumptive diagnosis of poliomyelitis. The diagnosis was borne out by clinical observation of the patient and by spinal fluid studies; initially, there was slight weakness of the right arm and leg. It was agreed that there was at no time any evidence of clouding of the sensorium or any kind of organic cerebral involvement. The patient's temperature subsided a few days after admission; further spinal fluid and neurologic study of the patient led all clinical observers to feel that the patient had passed through a virtually non-paralytic poliomyelitis.

The most striking problem which the patient presented during hospitalization lay in the area of his emotional reaction to his illness and to hospitalization. Shortly after admission, the patient developed a panic state, so profound and extensive in its nature that it might technically be termed a brief schizophrenic reaction. The patient lay in his bed throughout the day hardly moving a muscle; he was mute. Only on the rarest occasions and with the most persistent prodding and coaxing, could he be stimulated to make a one-syllable response to a question. His eyes would dart uneasily back and forth about the room; his facial musculature would break into a wide grimace which at times seemed to be an anxious giggle, and at other times seemed to be almost a prelude to tears. On a few occasions he arose at night and wandered about the halls in a stiff, aimless way, and, on one occasion he was found clumsily trying to remove the screen from the third floor window of his room. No verbal communication could be established between the boy and anyone about him. The nursing staff was alarmed, quite justifiably, that this boy might develop a destructive panic-state at any time, and injure himself as well as others.

Interviews with the parents revealed that the patient had always been a rather anxious, shy, withdrawn boy; he had, however, made a socially adequate adjustment at home and in school. He was very closely attached to his mother. The relationship with his father seemed to be a distant one; both parents tended to be withdrawn and anxious individuals. The boy had never been separated from his family for any significant period of time

and the emotional life of the patient centered almost exclusively around the family, who lived on a farm one hundred miles from the hospital. Upon careful questioning, it was found that the patient's emotional upset had actually begun when he and his parents had been informed that the boy had poliomyelitis, and should be brought to the hospital immediately. The patient had thereafter said very little except to express his great fear at being separated from the family, and had asked a number of anxious questions as to whether he would have to wear a brace, and have an operation on his knee.

In the hospital, psychiatric consultation was soon requested, and the nature of his major psychologic reaction to hospitalization was quickly evident. A program was instituted whereby all persons in contact with the patient gave him specific and extensive reassurances and interpretations of his difficulty. The patient was moved to a position in the hospital ward where increased interpersonal contact with the nursing staff was at all times possible. Precautions were taken to make it unlikely that the patient would attempt self-destruction at some point in his panic; the windows of his room were carefully secured. The joint efforts of the nursing staff, the physicians, and the special service personnel of the hospital were devoted to the establishment of reassuring interpersonal contacts with the patient to help him emerge from the profound panic and withdrawal which hospitalization and his illness had precipitated. The patient's condition remained unchanged for several days. On the fourth to sixth hospital days, the patient progressively emerged from his panic and withdrawal; on his seventh day, he had become a somewhat tense but otherwise cheerful boy who communicated well with the persons around him. A careful interview with the parents and the boy preceded his discharge. The psychiatric social worker was useful in making plans for a rapid return to his normal activities. The patient's course upon leaving the hospital was uneventful; after this rather serious emotional reaction to hospitalization, he recovered and returned to his previous routine of life.

Case 2. This ten-year-old boy, the third in a family of four children, was referred from the out-patient clinic where it was noticed that he suffered from a gross tremor of the hands while in the process of being admitted to the hospital for a tonsillectomy. Upon examination, it became apparent that the patient was in a

marked state of anxiety, of which the gross and obvious tremor was a physical concomitant. It was found that this tremor had begun that day, shortly before the patient came to the hospital.

Six months earlier, the patient's brother, sixteen months older than the patient, had been seriously injured by a rifle shot in the abdomen while on a hunting trip with the patient and some other boys. For some time afterwards, it was feared that the injury might possibly prove fatal, but the patient's brother had gradually recovered under care in this hospital. At the time the patient was admitted for tonsillectomy, his brother was back in the hospital for a check-up of certain residual gastrointestinal complaints resulting from his injury. The relationship of the patient and this brother had been extremely close, but in this relationship the older brother was the controlling and dominating personality. He left the patient little initiative of his own, and beneath the patient's placid and passive docility to his brother, lay a great deal of resentment and hatred. The patient was described as a tense and conscientious boy who rarely gave expression to angry or aggressive feeling. Psychological testing added confirmation to the clinical impression that the patient had been terrified by this violent accident as a realization of his angry but unacceptable impulses toward this brother. A great feeling of guilt and self-accusation centered about the almost fatal accident, though the patient had not actually done the shooting. To this patient, a tonsillectomy was vaguely and greatly feared as a retaliation procedure in return for his hostility to his brother, and which had become such a gruesome though accidental reality to him. Although the patient's extreme distress was evidenced by anxious tremors, no one around him seemed to understand what had happened to him. His parents thought his distressed state was due possibly to interruption of his school work by hospitalization for the operation.

When these facts were understood, the proposed tonsillectomy was re-evaluated with the physicians in charge. It was agreed that the patient would be better served if the procedure was cancelled; strong assurances were given to the patient, about not requiring a tonsillectomy at this time; he was also told that very possibly the operation might not have to be done, in the future, either. Shortly after such reassurances, the patient's tremor ceased entirely and his tension visibly ebbed. It was felt that specific interpretation to the patient or his family would, quite possibly,

be very upsetting to the patient. Such interpretations can be made only in the context of intensive, prolonged child guidance, and clinical treatment, which were not available in this boy's home town, and very probably, were not indicated here. A follow-up note on the patient, many months later, indicated that he had returned to his previous, reasonably good, social adjustment at home and had continued asymptomatic. It was felt that the comprehensive evaluation of the patient's emotional status, as part of the medical work-up for tonsillectomy, had been instrumental in avoiding an operation which might have had emotionally damaging effects upon this patient. It was agreed that the emotional evaluation of the patient was much more important than the surgical indications for the proposed tonsillectomy.

To a child hospitalization may, in varying degrees, represent (a) abandonment and rejection by the parents; (b) deliverance over to persons intent on harming him, with grave fears of physical damage and mutilation by those persons; (c) fear that some physical change, or alteration of body functioning will be inflicted on him; (d) that this is a prelude to his death; (e) that he is being subjected to this painful and frightening experience to atone for a feeling of guilt for something he thinks he has done; (f) that this is punishment or a disciplinary measure by the parents. Illness may be interpreted by children as punishment for their "badness."

There is a wide variety of symptom and personality problems which may follow traumatic hospital experiences.[4, 11] Among the more common reactions are (a) eating problems, with either refusal to eat or over-eating; (b) sleep disturbances, such as insomnia, nightmares or phobias of the dark; (c) enuresis, or fecal soiling; (d) regression to earlier levels of behavior and the loss of previously achieved levels of training and social functioning; (e) tics; (f) depression, restlessness, anxiety; (g) terror of hospitals, medical personnel, hypodermic needles, etc.; (h) death fears; (i) mute, autistic regression to uncommunicative states, of frightened withdrawal from contact with people; (j) hypochondriacal body, over-concern, or actual delusions about body functions; (k) hysterical symptoms, such as aphonia after tonsillectomy.

What can be done to alleviate the stress of hospitalization and surgical procedures for children? The hospital should be organ-

ized to meet the emotional needs of the child[12, 13, 14, 15, 16]; the child should not be manipulated to meet the routines of the hospital. A program for progress in this direction is given below; it follows Loeb's[13] discussion on problems in this area.

A. *Admission Procedure:* 1. The child should be informed of the approaching hospitalization by his parents and doctor, a few days or more before admission. It should be explained without anxiety and with appropriate reassurances. Emphasis should be made (a) that the separation of parent and child would be temporary and not a complete one; (b) that the hospitalization is necessary for the child's health; (c) that familiar contacts, such as a favored toy, a known physician, visiting by the parents, etc., would be maintained, and, (d) that the purpose of hospitalization is to help the child and make him well.

Booklets for children, such as the Boston Children's Hospital's "Johnny Goes to the Hospital," or, the booklet put out by the Oakland, California Children's Hospital of the East Bay on tonsillectomy, are useful in bringing the whole experience to the child in simple terms, such as a picture book to color.

2. The parents themselves should understand the proposed hospital procedure. They are required to surrender their usual protective, supportive parental role with the child. They need the reassurance and friendliness of the hospital personnel to whom they have given their child for a time.

3. The initial bath can be given by the parents. This involves alteration of common hospital routines, but hospitalization is for the welfare of patients, not the preservation of established systems.

4. A familiar toy or treasure should be the constant, comforting companion of the child in this awesome, unfamiliar venture which he is experiencing.

5. Whenever possible, admission should occur on a previously set day and time, about which both child and parents are informed.

6. The child's name or nickname, as used in the home, should be entered on the records and put on the foot of his bed. Many a child, called "Billy" at home, feels himself misidentified and lost when all persons about him call him "William" or "Willy," names he has never before heard.

7. Someone, a nurse or an occupational therapist, should explain to him the ongoing activities on the ward, and identify some

of its personnel, before his mother leaves. He should not be confined to bed if he is quite well.

8. Some data regarding the child's habits of sleeping, eating, elimination and play adjustment should accompany him to the ward and be available to the nursing personnel.

9. He should be prepared for a painful experience; data may be withheld from him, but he should never be told lies. Date of discharge should be made definite only when the nurses and doctors are reasonably certain they can live up to the promise made.

B. *The Hospital Situation:* 1. A toy cabinet should be available on each ward, and a person should be responsible and see that the supply is maintained and that the toys are given to the children. Toys should be inexpensive, simple and relatively durable.

2. For all children who will be hospitalized for long periods of time, and for many children who will be hospitalized briefly, it is useful to have an on-going grade school and high school educational program which will enable the child to keep pace with his school work. Also, a circulating library is useful with a well supplied book-cart, making daily ward visits.

3. Outlets for pent-up aggressiveness and tension are important. For this purpose, carpenter benches, rhythm bands, finger paints and hammering toys are useful. One hospital is known to have set up a punching bag.

4. To meet the emotional needs of children on hospital wards, a position of "ward mother" has been suggested. She would be someone to offer consolation, a bosom to cry on, a friend in time of trouble and a roving trouble shooter.

C. *Visiting:* 1. Liberal visiting by the parents is helpful. The responsible physicians should be available, at specific times, to talk with the parents personally or by phone. The parents should be oriented on the medical status of the child by the nurses and how they may best handle crying, questions about the child's return home, etc.

2. When parents live a long distance from the hospital, it is often useful to provide the child with a series of daily post cards; the parents address them when they first bring in the child. The child may write, draw or scribble on one card each day and then it is mailed to the parents. The parents likewise may be supplied with cards addressed to the hospital, and they are urged to send

one daily to the child. A supportive communication between child and distant parents may thus be established.

3. One hospital is known to schedule visiting from five to seven in the evening; parents may then feed the child his evening meal. This also allows working fathers time for evening visiting.

D. *The Feeding Situation:* The crucial aspects of feeding children involve a variety of food and leisure to feed them. Within limits, the unfamiliarity of food to a child should be approached by finding out what food the child likes and knows. Feeding should be encouraged as a pleasurable experience for both the children and the personnel feeding them. Feeding children can be an inherently pleasurable activity for women, and when it is made so, the children will tend to relax and eat better. The use of rocking chairs on baby wards for nurses who are bottle-feeding infants is often very helpful.

E. *Personal Identity:* 1. Every effort should be made to preserve the identity and individuality of the child in the hospital. Ward decorations should, as much as possible, be the work of the children themselves.

2. Discussion of the child's case on teaching rounds should, of course, never be made within his hearing.

3. When the child is upset, some individual evaluation is indicated. Social workers, psychologists and psychiatric consultants are useful.

4. Traumatic procedures, such as venapunctures and injections, should always be done with awareness that they are difficult for children and needless repetitive traumas of this sort should, of course, be avoided.

F. *Special Services:* These include occupational therapists, teachers, ward mothers, and a good educational program on both medical and emotional topics for nurses, aides and other hospital personnel.

The ideal hospital would include all these items and programs; it would also have a small psychiatric team, including a psychologist, a social worker and a psychiatric consultant for consultation and teaching purposes. Ideal conditions are not expected, but the incorporation of, at least, some of these ideas into the on-going program of each pediatric ward will make hospitalization more beneficial for the children, and a more stimulating and satisfying

atmosphere in which physicians, nurses and hospital personnel may work. The immediate and long-range mental hygiene of the child and the community will be benefited.

SUMMARY

The emotional trauma of hospitalization and surgery to children is due in large part to the fact that the hospitalized child is subjected to essentially the same routines and management as the hospitalized adult. Special attention to the emotional immaturity of the child is often not reflected in the development of special techniques and procedures, and the careful cultivation of a supportive emotional atmosphere. Hospitalization is often, therefore, a frightening and emotionally damaging experience to the child, possibly leaving a mark on later personality development. Comprehensive measures for meeting the special emotional needs of the child in the hospital are outlined.

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PRIMARY CARCINOMA OF THE LIVER WITH CIRRHOSIS*

Report of Case

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and
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Primary carcinoma of the liver is uncommon in children and seldom present in combination with cirrhosis.[1] In a review[2, 3] of 90 cases collected from the European and American literature, cirrhosis was found in only two patients, both older children. However, cirrhosis is present in 87 per cent of adults with primary carcinoma of the liver.[4]

It is the purpose of this paper to report a case of primary carcinoma of the liver with cirrhosis, occurring in a 12-year-old child.

CASE REPORT

History. A 12-year-old Negro female was admitted to the Kings County Hospital on July 20, 1955 because of persistent, severe abdominal pain of four days' duration. On July 18, the dorsum of both feet became swollen and the right side of the neck and shoulder painful. At this time, the mother observed that the child was feverish and breathing rapidly.

Four weeks before admission, the child complained of a moderate epigastric pain which improved with "treatment for a strain." She seemed perfectly healthy until the onset of pain. Her growth and development were normal.

Physical Examination. The child was well developed and well nourished; weighed 115 pounds and measured five feet three inches in height. She appeared acutely ill, anxious, and constantly tossed in bed complaining of "belly-ache." The respirations were 32 per minute, pulse 116 per minute, temperature 101°F., blood pressure 90/60 mm. mercury. The dorsal surfaces of the feet were edematous. The skin of the abdomen was shiny and taut. There was a visible bulge in the right upper quadrant. This area was extremely tender and examination was vigorously resisted. Palpation of the remainder of the abdomen was partially tol-

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erated. A fluid wave and shifting dullness was elicited, but the severe tenderness rendered these findings doubtful. The liver edge was firm, smooth and extended below the umbilicus. The spleen was 1.5 cm. below the costal margin. The lymph nodes were small. The heart was not enlarged, and there were no murmurs. The skin and sclerae were not icteric. The lungs were clear. When the right side of the neck and shoulder were touched, she winced with pain.

Laboratory Studies. Blood: Hemoglobin 12 gm., RBC 4.5 million, WBC 5,400 with 50 per cent mature polymorphonuclear cells, 6 per cent band forms, 42 per cent lymphocytes and 2 per cent monocytes. The erythrocyte sedimentation rate was 45 mm. per hour.

Urine: Specific gravity 1.029, albument 0, sediment 1-2 RBC and 5-6 WBC per high power field. Throat culture was negative for pathogens. Fasting blood sugar was 90 mg. per 100 cc., total cholesterol 163 mg. per 100 cc. and B. U. N. was 3 mg. per 100 cc. Tuberculin test was negative (1-10,000), and Wassermann test was negative. Serum total protein was 6.9 gm. per cent with AG/ ratio 3.7/3.2. Icteric index was 32. Total bilirubin was 5.9. *X-ray examination:* there was no evidence of pleural or pulmonary disease. The abdomen showed an enlarged liver and spleen and a generalized haziness suggesting ascites; long bones and skull were negative.

Course. It was evident that several conditions causing hepatomegaly—right pleural effusion, cardiac failure, parasitic invasion, and cirrhosis—could be promptly excluded. In view of the enlarged, painful, tender liver, palpable spleen, and dependent edema of the dorsum of the feet, thrombosis of the hepatic vein was the initial impression. Therapy was directed towards relieving the pain with analgesics and combating infection with antibiotics. Pain and fever subsided slightly.

Daily urines remained unaltered until July 25, when bile was noted. The next day the sclerae and skin were jaundiced. The possibility of either an acute hepatitis or neoplasm of the liver was then considered.

On July 31, the patient suddenly became extremely distended and complained of intense "belly ache." Four hours later she lapsed into unconsciousness and died.

Postmortem Findings. The postmortem examination was performed by Drs. J. Velazquez and A. Coblenz.

Abdomen. The peritoneal cavity contained 2,000 cc. of blood. A large fresh blood clot, measuring 10 by 6 cm. in diameter, was loosely attached to the inferior and superior surfaces of the right lobe of the liver. The liver weighed 4,200 grams. The external surface was coarsely granular and studded with nodules gray-white in color. On cut section, the right lobe was almost completely replaced by a mass of soft tumor tissue, while the left lobe revealed multiple tumor masses. The spleen was slightly enlarged.

Thorax. Free fluid was not evident in either pleural cavity. Several small metastatic lesions, varying from 2 mm. to 1 cm. in diameter, were encountered in the right lung and subpleural area.

Esophagus. There was marked dilatation and tortuosity of the veins on the mucosal surface.

Microscopic. Liver: Liver cell carcinoma (hepatoma) with minimal cirrhosis.

Lung. Subpleural metastasis, moderate congestion.

There were no remarkable changes in any of the other organs, except for some postmortem autolysis of the small intestine and pancreas.

Anatomical Diagnoses. 1. Primary carcinoma (hepatoma) of the liver; 2. Cirrhosis of the liver; 3. Hemoperitoneum; 4. Esophageal varices; 5. Metastasis to the right lung.

DISCUSSION

In the infant and child, primary malignant neoplasms of the liver are silent growths. When symtoms appear, liver enlargement is already manifest and the tumor has reached a fatal stage.

Symptoms[4] are caused by pressure of an enlarging liver, necrosis and hemorrhage within the tumor substance, invasion, thrombosis and rupture of large hepatic veins, intrahepatic spread and metastasis, rupture through the capsule with hemoperitoneum, and invasion of the portal vein. The usual clinical features are vague gastrointestinal symptoms, fever, an acute abdominal episode, right upper quadrant pain, diffuse abdominal pain, dependent edema, cachexia, anorexia and anemia. Ascites, jaundice, shortness of breath and hematemasis may occur. A conspicuous abdominal bulge may be the first evidence of liver involvement.

Jaundice, usually mild, is due to tumor pressure on intrahepatic ducts or hepatic insufficiency from liver destruction. Edema

is dependent and results from thrombosis of the inferior vena cava by invading tumor tissue. Pain is acute, usually persistent, and is caused by liver capsule involvement resulting in perihepatitis or rupture. Epigastric discomfort, pain and vomiting are due to impaired gastric mobility caused by pressure against the stomach and peritoneal irritation. Spleen enlargement results from portal obstruction and is often associated with liver cirrhosis.

The outlook is good[5, 6] with surgical excision of the benign solitary hemangioma, hamartoma, liver cell adenoma, and occasionally the single teratoma.[7] Malignant primary tumors of the liver, however, still offer a hopeless prognosis.[8, 9, 10] Death is reported as early as five days after the first appearance of symptoms.[4]

Primary malignancies are classified as hepatomas, cholangiomas, sarcomas, myxomas, and adenocarcinomas. Metastasis are intrahepatic and rarely pulmonary, bone, or brain.[2]

The frequency with which cirrhosis is found in cancerous livers of adults suggests some relationship. Three theories have been suggested—that cirrhosis precedes and influences the development of carcinoma; that it is secondary to the neoplasm; that cirrhosis and liver malignancy have the same provocative factors.[4] Scientific support for any of these concepts is lacking. In children, the paucity of examples of combined lesions does not permit adequate analysis. Fifty-two per cent of reported primary carcinoma of the liver occurred in children under the age of two years, but cirrhosis was found only in two older children.[2, 3] In both previously reported cases of cirrhosis with primary carcinoma of the liver and in our own patient, there was evidence, clinically or pathologically, of hepatic and portal vein thrombosis due to tumor invasion. That such thrombosis may cause a diffuse type of cirrhosis is accepted. The length of time required for cirrhosis to develop under these conditions is unknown. Hence, the role of thrombosis of the hepatic and portal veins, perhaps in a liver previously traumatized by infection or malnutrition, is a basis for further investigation. It is significant that primary cancer of the liver is the most frequent malignancy found in African Negroes, who notably suffer from cirrhosis secondary to chronic malnutrition.[4]

The etiology of primary carcinoma of the liver in the infant and child is still in the dark. It must be kept in mind, moreover, that this entity also occurs in newborns.[2, 3]

SUMMARY

A case of primary carcinoma of the liver combined with cirrhosis in a 12-year-old child is presented. Vague epigastric pain, starting four weeks before admission, was the first indication of illness. An attack of severe, unrelieved abdominal pain, edema of the dorsum of the feet, pain in the right shoulder and neck, fever and rapid respiration necessitated hospitalization. The patient died, approximately six weeks after the first symptoms appeared, during an attack of intense abdominal pain and distension. Postmortem examination revealed a primary carcinoma of the liver, hemoperitoneum, metastasis to the right lung, esophageal varices, and cirrhosis of the liver.

Cirrhosis is rare in primary carcinoma of the liver in children. The role of cirrhosis in the etiology is discussed, but no definitive answer to this question is presently available. In adults, cirrhosis is a common finding.

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SOME OBSERVATIONS ON CELIAC DISEASE. H. A. Weijers, W. K. Dicke and J. H. van de Kamer. (Maandschr. kindergeneesk., 23: 451-461, Dec. 1955).

Information on celiac disease has increased particularly as the result of studies with dietetic therapy, which revealed that the steatorrhea observed in this disorder is not so much dependent on the quantity of fat ingested as on the type of carbohydrates included in the diet. Dietetic measures have proved decisive in the treatment. The authors comment particularly on the favorable effects obtained with a diet free of the gluten of wheat, rye, and oats.—*J. A. M. A.*

CONGENITAL ENDOCARDIAL FIBROELASTOSIS AND TOTAL HEART BLOCK

Report of Case

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Endocardial fibroelastosis is an unusual disease which in the last decade has not infrequently been observed at autopsy, in infants dying before two years of age. Its manifestation in infants has received considerable attention in medical literature in recent years, and evidence of its being a developmental disturbance of unknown origin has accumulated. The absence of inflammation in the presence of severe endocardial proliferation and myocardial hypertrophy makes it almost certain to be of intra-uterine origin. It is our belief that it should be grouped with congenital malformations, and further clarify the classification of diseases of the heart.

The complete conduction and disassociation, without any gross cardiac anomaly, makes our case unusual indeed. Stadler et al.,[7] in 1950, (to the best of our knowledge) reported the only other case of total heart block with endocardial fibroelastosis in an infant.

CASE REPORT

L.P. was a normal, full term, spontaneoeus delivery from the right occipito-anterior position born on July 26, 1953. His mother was a gravida vii, Para vi, twenty-nine-year-old Puerto Rican with no history of infectious diseases during pregnancy. She was Rh+ with a positive Wassermann which was treated with penicillin several times. She was discharged with a positive serology, despite treatment with penicillin during past pregnancy.

Physical examination at birth revealed a cyanotic child, weighing six pounds ten ounces, with a weak cry and labored, rapid respirations. The ventricular rate was forty-six and a harsh systolic murmur was heard over the precordium. An electrocardiogram showed a complete heart block, and a chest plate revealed a diffusely enlarged heart.

Examination of peripheral blood showed a 5,510,000 RBC with 54 per cent nucleated cells, and a 15,750 WBC with a 24 per cent polymorphonucleosis. Mazzine was negative. The child was

treated with antibiotics, oxygen and humidity, but became cyanotic whenever removed from the oxygen tent. There was a slow improvement with a moderate gain in weight after being gradually weaned away from oxygen and he was discharged on August 19, 1953. The child apparently was well until he was admitted on March 19, 1954 with complaints of fever and cough. Physical examination on admission revealed an acutely ill eight-month-old baby who was irritable, pale, in moderate respiratory distress, with cyanotic lips and cold extremities. Blood pressure 150/70, pulse rate 48, respiration 45, temperature 100.4° F. The chest revealed subcostal retractions, and there were râles in the left lung field. A loud systolic murmur was heard over the entire percordium and a brachycardia of 48 was noted. The liver was palpable three finger breadths below the right costal margin, and the spleen one finger breadth below the left costal margin. Roentgenogram of chest revealed a heart markedly enlarged in all directions. A complete heart block was evident on electrocardiogram. The urinary albumin was three plus, the Wassermann negative, and blood culture revealed diptheroids. Examination of peripheral blood showed a WBC of 20,400 with a polymorphonucleous and a hemoglobin of a 11.9 grams per 100 cc. He was treated with oxygen, antibiotics and digitalized, and was clinically well in several days.

During the nine month hospital stay of this patient, he was on border-line cardiac compensation and on several occasions went into frank congestive failure. He was maintained on digitalis and antibiotics, but his hospital course was repeatedly complicated by temperature elevations. Many of these episodes were precipitated by intercurrent infections. Blood cultures, taken during his temperature spikes, were persistently non-contributary. They were all treated with a wide spectra of antibiotics and oxygen to which he responded. On December 23, 1954, he spiked a temperature of 102° F. which did not respond to therapy, and on December 27, 1954, his temperature rose to 108° F. He did poorly, and died on the following day.

Anatomical Diagnosis. Macroscopic inspection of the heart revealed the following: Mitral stenosis, endocardial fibrosis, dilatation of left ventricle (severe), hypertrophy of left ventricle (moderate), and bulging of interventricular septum into right ventricle. There

was a relative hypoplasia of right ventricle, dilatation of right auricle, which was moderately severe. A functionally patent foramen ovale with guarded valve and dilatation of arch of the aorta were noted.

Histological Diagnosis. Studies of right and left ventricles, the associated atria and the relative papillary muscles show a progressively thickened, diffusely scattered hyaline fibroblastic envelopment of the musculature of the aforesaid structures. The interstitia show moderate fibrosis, the latter embracing the hyaline media of the vasculature of the heart. The endocardium, involving the mural and valvular structures, shows a similar endocardial fibroelastosis. The thickened fibrosis is universally observed throughout the heart and involves components of endocardium, interstia and perivascular structures.

DISCUSSION

A summary of the clinical and pathological features based on 76 recorded cases, as reported by Gowing,[1] are as follows:

The disease manifests itself in early life, 80 per cent dying during the first year, the age of death ranging from 0 (stillborn)—6½ years. There was a slight preponderance of males (males 61 per cent; females 39 per cent). The children may appear normal at birth and progress satisfactorily for some time. The onset of cardiac decompensation frequently is sudden, very often being precipitated by intercurrent infection. Evidence of cardiac failure usually appears rapidly, namely, cyanosis, dyspnea, irritability, anorexia and venous congestion. Embolic phenomena and cardiac conduction abnormalities are often present. The heart is usually markedly enlarged in size, and murmurs vary from case to case depending on valvular involvement. Very seldom has fibroelastosis been diagnosed before death. The heart, on autopsy, is usually enlarged, the myocardium, especially that of the left ventricle, is thickened and hypertrophied. There is dilatation of chambers, the left ventricle being particularly affected. On opening the heart, the mural endocardium of the left ventricle especially is involved more often and more severely than the right. Deformities of the mitral or aortic valve are present in 50 per cent of cases. The endothelium is usually intact except where thrombus has been

deposited—its cells may be swollen and prominent. Between the endothelium and myocardium is a thick layer composed of collagenous and elastic fibers, mainly disposed parallel to the surface. A moderate number of fibrocytes are scattered among the fibers but inflammatory cells are absent. Of the cases under review, less than 10 per cent show an associated congenital anomaly.

A problem that arises with endocardial fibroelastosis is how to explain the severity of the clinical symptoms with rather unimpressive morphological changes. Thomas et al.,[3] advanced a few explanatory theories which possibly all play a part. "One theory is that the thickened endocardium interferes wtih proper contraction and relaxation of the heart in much the same way as a thickened pericardium does in constrictive pericarditis. Another possibility is that the thickened endocardium interferes in some way with the proper conduction of contraction impulses. This theory is particularly attractive, since most cases show various arrhythimas or delayed conduction or both. That the thickened endocardium interferes with the blood supply to the underlying muscle is another possibility."

Endocardial fibroelastosis generally is considered to be a developmental disturbance rather than a fetal endocarditis, and should be classified with congenital malformations of the heart.

Gross,[6] in 1941, doubted that the occurrence of endocarditis in the fetus had ever been established and concluded that "the valvular and parietal endocardial changes seen in these cases are better explained on the basis of a development defect."

Edmunds and Seelye[8] reported six representative cases of endocardial fibroelastosis and asserted that "the older concept of an inflammatory pathogenesis of so-called fetal endocarditis is rejected in favor of the developmental origin of the lesions."

Thomas et al.,[3] in a review of twenty cases of endocardial fibroelastosis, discard the once popular theory of fetal endocarditis because of the lack of histological evidence of healed or active inflammation.

Johnson,[5] in an attempt to explain its developmental origin, suggests that it results from intra-uterine endocardial anoxia due to premature closing of the foramen ovale at a crucial stage of development. The foramen ovale was functionally closed in our case.

Prior and Wyatt[3], in a review of eight cases of endocardial fibroelastosis, corroborate the evidence that this condition is a developmental disturbance of mesenchymal tissue, and that both mural and valvular lesions are of a non-inflammatory nature. Because of the nearly complete absence of elastic tissue from the valvular lesions, they suggest the term endocardial dysplasia to replace fibroelastosis.

Weinberg and Hunelfarb[4] presented two cases of fibroelastosis occurring in siblings with lack of inflammatory stigmata in either the endocardium or myocardium. They also mentioned the fact that, according to the statistical analysis of a monograph by D. P. Murphy[9], the same congenital defect tends to recur in siblings in more than 30 per cent of instances which tends to further substantiate the developmental origin of this condition.

SUMMARY

A case of endocardial fibroelastosis with complete heart block was presented. The clinical and pathological features of this condition were discussed, and its developmental origin was corroborated by our case and the various references made. The associated bradycardia is rather unique, and, pathologically, we can only theorize that the thickened endocardium in some way interferes with the proper conduction of contraction impulses.

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PEDIATRICS AT THE TURN OF THE CENTURY

From time to time the Archives, which was the first Children's Journal in the English language, will reprint contributions by the pioneers of the specialty over fifty years ago. It is believed that our readers will be interested in reviewing such early pediatric thought.

PYLORIC STENOSIS IN INFANTS*

Report of Two Operative Cases

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Boston.

The following two cases of pyloric stenosis are reported as being of interest, from the fact that in one complete recovery followed after operation, and in the other an interesting postmortem examination was made.

CONGENITAL PYLORIC STENOSIS IN AN INFANT THREE WEEKS OLD. OPERATION. RECOVERY.

This case of pyloric stenosis is worthy to be reported for several reasons.

(1) It is the youngest case in medical literature to be operated upon with complete recovery.

(2) There is only one other case reported at this early age. This was one of Thompson's 6 cases which was operated on by Stiles and died in thirty-six hours.

(3) It exemplifies in an absolutely typical manner the clinical features of complete pyloric stenosis.

(4) It contains very strong evidence that complete pyloric stenosis may exist as a congenital condition.

This case was seen by Dr. Ladd in consultation with Dr. Henderson, of Reading, Mass., and with Dr. John C. Munro, of Boston, to whose courtesy we are indebted for the privilege of placing it on record.

*Read before the Seventeenth Annual Meeting of the American Pediatric Society held at Lake George, New York, June 19, 1905.
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D. P., a boy, was three weeks old. He was the second child. The first baby was nursed with absolutely satisfactory results by the mother. The mother had an abundance of milk and was of a temperament well adapted to nursing. The baby weighed at birth ten pounds when dressed, and appeared perfectly healthy. The labor was normal and the mother made a quick convalescence. The baby was put to the breast at the usual time and at two hour intervals. About the time the milk came freely, vomiting began and had continued, not a single feeding being retained. The vomiting occurred usually soon after the nursing, sometimes as much as an hour afterward and was generally expulsive in character. There was no bile in the vomitus. The breast or bottle was always taken greedily, the baby acting as if he were starved. The movements were very small in amount, green in color, and consisted mostly of mucus and a few small specks of matter which may have been fecal, but the amount was so small as to indicate that practically a complete obstruction prevented the passage of the food into the intestines. There was no difficulty in deglutition.

Dr. Henderson had tried various dilutions of the breast milk, condensed milk and water, a 4 per cent solution of milk sugar, and a 2.5 per cent solution of lime water. He also had experimented with amounts ranging from one drachm of these various mixtures to 2.5 ounces. The result was always the same—the feeding was not retained. On a few occasions the baby took as much as 2.5 ounces at a feeding, which showed that the capacity of its stomach was quite as large as normal, if not larger.

The physical examination showed, so far as could be determined, a child normal in all respects except for a considerable degree of emaciation. It probably did not weigh more than six and a half to seven pounds. The abdomen could not be satisfactorily palpated as the baby cried vigorously when disturbed. Under ether, moreover, nothing abnormal could be felt in the region of the pylorus, but the outline of the distended stomach could be seen through the relaxed abdominal wall. The pulse was 200. The temperature and respirations were normal.

The diagnosis of pyloric stenosis was made from the clinical picture and immediate operation advised. It was quite obvious that the food was not principally responsible for the symptom of vomiting. The practical absence of fecal movements showed that

whatever nourishment was obtained could be only a small amount which might come from direct absorption from the stomach itself. This was not enough to prevent rapid emaciation and loss of strength. The indication for exploratory laparotomy was, therefore, quite clear.

For the next forty-eight hours while the parents were making up their minds whether to risk an operation, it was suggested that a modified milk calling for a 2.00 fat, 5.00 sugar, and 0.75 proteids should be prepared, peptonized for one hour and given by rectum every four hours, two ounces at a time. At the same time teaspoonful doses of breast milk were to be given by mouth every hour. The enemata were retained and appeared to give the baby more strength. The teaspoonful doses of breast milk were retained until about one and one-half ounces had been taken and then the whole amount was expelled as usual by vomiting. After that teaspoonful doses of brandy and water were given every hour and were presumably directly absorbed, but larger quantities were vomited. The case was operated on by Dr. John C. Munro at the Carney Hospital. Operation under ether. Median incision. On opening the abdomen the stomach was found considerably distended with gas, and was dilated to about the size seen in a normal infant of three months, with a capacity of about four ounces. At the pylorus was an ova' solid tumor approximately three quarters by three-eighths of an inch in diameter. It was situated high up under the liver, which explained the fact that it could not be felt before operation even under full narcosis. A posterior gastro-enterostomy was made with clamps and suture, a jejunal loop being used. The jejunum was no larger than a pencil, and by the time the various sutures were placed, three-fourths of the gut were taken up in the anastomosis. An opening easily admitting the finger tip was made. The patient was in fairly good condition at the end of an hour.

The subsequent history and after treatment of the case were as follows:—During the day of operation the patient was given brandy m-x, salt solutiotn ℥-ss per rectum every three hours for two doses; then peptonized milk ℥-I, and brandy m-v per rectum every four hours. Sterile water was given in drop doses by mouth during the night.

On the following day, June 29, there was a small movement

of the bowels with gas. Rectal feeding was continued and peptonized milk was begun by the mouth, beginning with drop doses and increasing gradually. In the afternoon peptonized milk by mouth 3-iv every two hours was started. The bowels moved three times during the night. From this time on recovery was uneventful, the fecal movements on July 2d being normal in color and consistency. There was very little vomiting and the child gained in weight rapidly. Discharged well on July 17. At the end of one year the baby was in health and physical development fully up to the standard of the average healthy infant.

PYLORIC STENOSIS IN AN INFANT FOUR WEEKS OLD. OPERATION. DEATH

This case was admitted to the Infants' Hospital, Dr. Rotch's service, on January 2, 1905, with the following history:—Vomits a good deal after every feeding. Has never kept down a feeding. Bowels move only with enemata. Movement shown is simply a green, loose movement, with mucus and no fecal matter. Passes water once in five hours.

Physical Examination. The infant was emaciated. The heart was normal. The lungs were negative. The abdomen was somewhat distended, but was soft and readily palpable. No enlargement of liver or spleen, and no tumors were detected. There was hyperresonance from just below the ensiform cartilage down to the umbilicus. Forty-five cc. of modified milk were given at eleven o'clock. At the time of the examination an hour later, on having the child sit up, the hyperresonance disappeared and was replaced by dulness extending to the level of the umbilicus, evidently from the fluid swallowed at eleven. Hyperresonance returned when the baby was placed flat on its back again. There had been no vomiting since the feeding at eleven. The rest of the physical examination was negative.

January 4. Vomits occasionally clear fluid.

January 5. Vomits more than on the first day. Peptonized milk was given by the rectum. Only boiled water was given by mouth.

January 6. Operation by Dr. Stone.

Medium incision from umbilicus upwards to just above the edge of the ribs. Wound carried through fascia to peritoneum.

Peritoneum incised. Stomach found fully distended. Pylorus firm, making a mass about one inch long by three-eighths of an inch in diameter. Below the pylorus the large and small intestines were completely collapsed. The omentum was pushed to the left, the transverse colon pushed back and the first loop of the jejunum drawn forward into the wound. The lowest anterior portion of the stomach was withdrawn from the abdomen and seized with clamps; the jejunum being too small to clamp, was seized with hemostatic forceps at a portion farthest from the mesentery and approximated to the stomach. A running stitch including the peritoneum and muscles was carried along the posterior approximated surfaces. An eliptical piece of the stomach was incised and a longitudinal slit was made cutting the duodenum in front of this stitch; a continuous silk stitch was carried around uniting these openings, and passing through all the layers. The posterior stitch was then continued around through the serous and muscular coats in front of the deep layer of stitches and tied at the starting point. The clamp and walling off gauze were then removed and the area washed off with salt solution. The stomach and the jejunum were returned to the abdomen. The omentum was tucked around the area. The incision was then closed with interrupted silk worm stitches through the entire abdominal wall.

During the operation which occupied about twenty-six minutes from the first incision till the last stitch in the abdominal wall was tied, the child's condition became very bad. Salt solution was given under the skin, and brandy minims 30. At the end of the operation the shock was extreme, the pulse was scarcely perceptible at the wrist, and the respiration was vey irregular, jerky and at long intervals. Heaters were applied and the foot of the bed elevated. The extremities were rubbed with warm alcohol. Brandy minims 15 was given subcutaneously after the infant was put to bed.

January 7, at about nine o'clock, the baby began to vomit a bright watery fluid and continued to do so during the day. One teaspoonful of whey was given every half hour up to ten o'clock and then every hour during the night. Nutrient enemata continued.

January 8. Half a drachm of water was given every hour. The enemata were not well retained.

January 9. Enemata omitted. Three teaspoonfuls of whey were given every hour and a teaspoonful of water every hour. The infant began to vomit again at 4 P.M., and vomited constantly during the night. Whey and water were omitted and the enemata resumed.

Januray 10. Vomited very little. Became very weak and died about 11 P.M.

January 11. Examination after death showed a healing incision one and three-quarter inches long above the umbilicus. No signs of inflammation. Adhesions of peritoneum with slight fibrino-purulent exudate on coils of small intestines and on edge of liver about the seat of the operation. Omentum adherent anteriorly. Pylorus very firm, admits probe two mm. in diameter easily. Coils of small intestines normally distended. The examination showed the cause of death to be a localized peritonitis behind the anastomosis. There had been apparently no leakage and curds had been passed in the movements.

The emaciation and weakness rendered the child a most unfit subject for operation, but in spite of this vomiting was immediately relieved by the operation, the consistency of the stools changed, curds appeared in the movements and the small and large intestines became normally distended. The outlook for recovery would have been excellent had it not been for the peritonitis which was obviously the cause of the recurrence of the vomiting and death.

The operation and subsequent course confirmed absolutely the diagnosis and would encourage one to undertake earlier operation on a similar case before weakness and emaciation became so pronounced.

The medical and surgical aspects of pyloric stenosis in infants have recently been so fully discussed in elaborate papers, especially that of Dr. C. L. Scudder, that it would but be repetition to bring them up again in reporting these cases.

It may however be said that while in the cases of complete pyloric stenosis there is seldom much difference in opinion as to the diagnosis and treatment, yet in the cases of incomplete stenosis, both congenital and acquired, judgments often differ. Certain general considerations should therefore always be carefully kept in mind as we ourselves have already met with a number

of instances in which the surgeon was inclined to operate where a diagnosis of even partial stenosis was not justifiable.

We should recognize that a case of faulty feeding without any organic lesion may exactly simulate partial pyloric stenosis and also note that stenosis as a cause of vomiting is very infrequent in comparison with the innumerable cases of severe vomiting in no way dependent on organic disease, but on disturbance in digestion and metabolism.

We should also remember that while we cannot assume that pyloric thickening is absent because a mass cannot be felt, yet that in this class of cases the diagnosis should be arrived at only after a process of exclusion by careful experimentation with the food, following the general principles of modern scientific feeding. Even then in the majority of cases often only presumptive evidence can be obtained, but it may be enough to justify exploratory laparotomy.

CONGENITAL LARYNGEAL STRIDOR*

PATHOLOGY WITH REPORT OF AN AUTOPSY

HENRY KOPLIK, M.D.
New York.

Congenital laryngeal stridor is a peculiar symptom complex which has long been a matter of investigation and speculation. The symptoms are admitted by all to be connected with the larynx and not allied to other conditions simulating it in which the structures of the nasopharynx are involved. Laryngeal stridor is a peculiarity of respiration which appears or is noticed shortly after birth. The infant otherwise may be in apparent health; as the infant lies quietly in its crib or sits in the arms of the nurse a peculiar crowing or grunting sound is heard with inspiration. This sound may be scarcely audible, or it may be heard at some distance, as across the room and of a loud sawing timbre. As a rule, the sound is heard only with inspiration, but may in severe cases be present during expiration, also. At times in the mild

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cases the grunting sound becomes inaudible, but reappears at intervals. These infants, if they are caused to cry or become excited, may at the end of inspiration develop a piping noise similar to what is heard at the termination of an attack in laryngismus stridulus.

Though many of these infants are rachitic, because some of them are bottle-fed, they are not all so, for I have seen infants breast-fed and free from all signs of rachitis who presented the above symptom complex. Nor do these infants necessarily present the Chvostek sign or any of the marks of "latent tetany," socalled, nor do all of them have socalled apneic attacks, although recently a case came under my observation—a newborn baby—which presented laryngeal stridor and apneic attacks. The picture, therefore, is a definite one, not necessarily merging with socalled convulsive respiratory conditions, such as laryngismus or apnea, common to infancy and childhood. Laryngeal stridor must not be confused with another condition which is commonly met with in the newborn and in older infants and children. In this state there is noisy breathing, more or less marked, which dates from birth, but which is distinctly due to an adenoid obstruction in the nasal passages. These infants make a snoring noise, either when nursing or in undisturbed respiration, but the noise is distinctly posterior nasal in its origin. In these cases, as in laryngeal stridor, there may be a retraction of the lower part of the sides of the thorax and of the suprasternal notch in inspiration. These infants are distinctly lymphatic, but the cases of laryngeal stridor are not necessarily so.

In laryngeal stridor there may be inspiratory retraction of the suprasternal notch, though this is not always the case. The most marked cases I have seen had no inspiratory retraction.

The affection appears soon after birth; hence the term "congenital", and may extend well into the period of childhood. Much has been written upon this affection, and confusion has been caused by the introduction of the term "thymic asthma" into its nomenclature. If the literature upon "thymic asthma" is sifted it will become apparent that all varieties of spasmodic respiratory conditions of infancy and childhood have at one time or another been grouped under this term. Laryngismus and apnea have been grouped as "thymic asthma." In other words, "thymic asthma" has been

utilized to include spasmodic or convulsive respiratory conditions, in which the thymus was supposed, on account of its enlarged or distended condition, to exert some disturbing influence. The thymus has also been held to be a causal factor in the production of laryngeal stridor. It would be well were the term "thymic asthma" dropped, inasmuch as in all the conditions with which the thymus has been linked in the nomenclature of thymic asthma there is scarcely any socalled asthmatic condition present, but rather something outside of the lung proper as an *etiological* factor.

The *symptoms*, also, as far as the physical signs are concerned, do not draw the lungs into the picture, affecting only secondarily the rhythm of the respiratory act.

This brings us to a consideration of the various theories which have been elaborated to account for the production of "laryngeal stridor." The first theory is, that the symptom complex is caused by a congenital malformation of the larynx and epiglottis. This malformation is congenital, and consists not only in an abnormally narrow glottis opening, but the epiglottis is so disposed that its sides are rolled up and almost in contact, and the aryepiglottic folds draw the tip of the epiglottis downward and backward, covering the superior opening of the glottis. Thomson has shown, as has also Luschka, that the infantile epiglottis is gutter-shaped, and it is only at the tenth year of life that this infantile type of epiglottis is lost and the adult type substituted.

In the cases of laryngeal stridor in which a postmortem has been obtained, the above abnormal anatomical condition was present. One of the first cases published was that of Lees, in which the child had suffered from laryngeal stridor and died of intercurrent diphtheria. In this case the aryepiglottic folds were apposed so that the epiglottis covered the larynx and a mere slit-like opening of the epiglottis was seen and through this breathing took place. A second case of laryngeal stridor in which autopsy was obtained was that of Refslund. This was the case of an infant two and one-half months of age, dying of intercurrent pneumonia. Here the larynx resembled closely that of the case of the present writer, whose case also died of intercurrent pneumonia, and in which the lateral borders of the epiglottis were apposed so as to form a mere slit which closed in the superior opening of the glottis and through which respiration took place.

The third autopsy obtained was a case of Variot in a child twenty-two months of age, dying of scarlet fever. In this case the stridor had existed from birth and there was an epiglottis deformed, though to a lesser degree than in the two preceding cases. Thus, in those cases of laryngeal stridor in which an autopsy was obtained there existed a distinct anatomical malformation of the epiglottis and superior opening of the glottis or larynx quite sufficient to account for the symptoms, and in one case the infant was two and one-half months old (Refslund), so that there could in this case at least be no question as to a postnatal factor in the production of the marked deformity

Recently, Thomson and Turner, of Edinburgh, have taken up the subject of laryngeal stridor and elaborated a theory in which the "primary element in the causation of this condition is a disturbance of the co-ordination of the respiratory movements, probably due to some developmental backwardness of the cortical structures which control them." In their monograph, the authors have shown that the infantile epiglottis has a tendency to guttershaped formation, and any disturbance of the rhythm of respiration would intensify the tendency of the lateral aryepiglottic folds to curl the sides of the epiglottis toward the median line, thus producing the malformation seen postmortem in cases of laryngeal stridor. Their theory is a combination of the nervous element with the anatomical deformity as a sequence of this nervous incoordinate breathing. These authors took the larynx of newborn infants and actually produced by means of suction on the trachea below the larynx a condition of the epiglottis closely simulating the antomical condition found by Lees, Refslund and Variot. Thomson and Turner surmise that the anatomical deformity of the epiglottis found in the postmortems of cases of laryngeal stridor was caused by the prolonged action of the irregular respiration, as shown in their experiments. However, this might appeal to us by its ingeniousness, the theory does not account for the cases like that of Refslund, in which the larynx was inspected two and one-half months after birth, scarcely time enough to have effected such marked anatomical changes as were seen in this epiglottis postmortem. Recently, the thymic origin of laryngeal stridor has been presented by Avelis, and more enthusiastically by Hochsinger. Hochsinger, by means of x-ray pictures, established to his satisfaction an en-

larged thymus in some 23 cases and in these cases laryngeal stridor was present. Hochsinger even goes so far as to revive the term "thymic asthma." This theory is not supported by anything but clinical life study of cases. In addition to the x-ray, Hochsinger has made a study of the percussion of the thymus, and has, to his mind, verified the organ as enlarged, thus confirming the x-ray pictures.

We will not attempt at the present day to analyze the data of Hochsinger, which may or may not be confirmed by future studies. It is our object to record a case unique in itself and one of exceedingly rare occurrence. The case occurred in my hospital service and died there while presenting the symptoms of an exaggerated form of laryngeal stridor. The exaggerated symptoms occurred in connection with the dyspnea caused by the pneumonia from which the child suffered. The autopsy, which was complete, enables the author to add evidence to the anatomical theory in the causation of the symptom complex of laryngeal stridor.

W. H., male, one year, the youngest of eight children. No history of miscarriage in the mother; parental history negative. Baby partly breast-fed. When six months of age had bronchitis; baby could sit up and say mamma and papa. Has no teeth and has signs of slight rachitis. Weighs eighteen pounds.

Since the age of three weeks, the parents have noticed that the breathing was noisy and that there was a crowing noise with the breathing. The child has been taken on this account to many clinics. At the age of five months the condition became more marked or worse and has persisted up to the time of the present illness.

Present Illness. Ten weeks ago infant became ill with an attack of convulsions, following which there came fever and a discharge from the left ear which lasted a short time; since then the child has not been well; for the past two weeks child has been quite ill and the breathing rapid and with crowing character. There were several convulsions during the illness. There has been a cough, followed at times by vomiting.

Status. On admission, the child appears to be well nourished; no teeth; signs of slight rachitis. There are heard on entering the room loud, noisy crowing or sawing inspiratory and expiratory sounds; otherwise child is not suffering from cyanosis or signs of

laryngeal stenosis. There is little, if any, retraction of the suprasternal notch, though there is great retraction of the diaghragmatic groove. The noisy crowing respiration is the prominent feature of the case and can be heard across the room. There are sudamina on the body. Nothing in the fauces, but an attempt to look into the fauces is always followed by a stoppage of respiration and a loud inspiratory crow similar to that which is heard in laryngismus stridulus:

Thoracic Signs. The loud breathing is heard over the chest, but there are distinct dullness, crepitant râles and increased vocal resonance at right base of the lung. There are also patches at the left apex and right apex behind of dullness, with crepitant râles The remainder of the examination negative. A stethoscope placed over the larynx confirms the supposition that the crowing sound is laryngeal.

Diagnosis. Congenital laryngeal stridor. Acute disseminated bronchopneumonia.

Subsequent History. The crowing stridor continued, the frequency of the respirations increased from 58, which it had been, to 70 a minute, the pulse 130—temperature ranged from 103° to 105° F., and the child died in convulsions with increasing signs of dyspnea, cyanosis and heart failure, twenty-four hours after admission to the hospital.

Autopsy revealed the lungs to be the seat of extensive disseminated bronchopneumonia, the right lung being most affected in its lower lobe. The thymus was large and weighed 25 grams. The epiglottis and larynx showed that the child had a condition exactly similar to the cases of Lees and Refslund. The epiglottis was curved backward and lay over the superior opening of the larynx. The lateral borders of the epiglottis were in contact, leaving a slit which varied from half a millimeter in its greatest extent from the tip of the epiglottis to a millimeter and a half at the arytenoid cartilages, where the space between the aryepiglottic folds was a little wider than above. The aryepiglottic folds were almost in contact and were thin and membranous. The larynx was slit open and presented nothing pathological, except that before the larynx was slit open an attempt to introduce the smallest size one-year intubation tube into the box of the larynx between the cords could not be carried out without great force, and

this was not attempted for fear of injuring the tissues for future study. The opening of the larynx, therefore, was narrower than normal. There was no membrane, no inflammation, or swelling, no cicatrices, either above, on or below the cords.

There are points of interest about this case which must be emphasized. The diagnosis was not difficult. Both the laryngeal condition and the condition of the lung were correctly surmised by the author before death. The peculiar breathing, though exaggerated and accelerated, was classically like that of many cases of stridor which had come under his notice.

A careful percussion of the thymus during life failed to give any positive data and still the thymus was found large postmortem. The enlarged thymus would no doubt be looked upon by some as corroborative of the thymus theory in its influence in the production of the symptom complex of laryngeal stridor. It must not be forgotten, however, that the thymus in this case in no way was demonstrated to press on the trachea and that the anatomical conditions of the larynx and epiglottis fully accounted for the production of the stridor. The thymus in the author's experience is found to be enlarged in many diverse conditions. In his studies on the thymus, made in conjunction with the Jacobi monograph on the subject, the thymus was found as heavy as 30 grams in children who had met death under the most diverse conditions, including pneumonia. Enlargement of the thymus is, therefore, not an uncommon postmortem finding. During life, also, many lymphatic children no doubt have an enlarged area of dullness over the thymus, or an x-ray may show an extended shadow, and yet it would be difficult to say whether such a thymus is not rather the result of, than the cause of, the pathologic state of the patient; we know very little of the function of the thymus. Why multiply the diseases traceable to its enlargement without at least an inkling of its function?

Laryngeal stridor may occur in conjunction with a large thymus, but if there coexist such marked distortion anatomically of the epiglottis and larynx, as in the cases of Lees, Refslund, and that of the author, it would be going out of our way to draw the thymus into the picture. The theory of Thomson and Turner also needs more confirmation in view of the fact that in four consecutive autopsies, Lees, Refslund, Variot and that of my own

case, the anatomical anomalies are fully sufficient to account for the symptoms. Until an autopsy reveals a perfectly normal larynx and epiglottis in a child in whom laryngeal stridor coexisted during life with a large thymus, we would be unwilling to entertain either the thymus theory or the theory of nervous incoordination of Thomson and Turner in its production.

ASTHMA IN CHILDREN. F. H. Wright. (J. South Carolina M. A., 51: 374-379, Nov. 1955).

Acute asthmatic attacks in children are accompanied by disturbances of pulmonary physiology. The form of the attack is consistent and predictable. Treatment is conducted by giving sympathomimetic drugs or aminophyllin to counteract spasm of the bronchial musculature; antibiotics or corticotropin or cortisone derivatives to decrease inflammatory reaction; and expectorants and humidified inhalations to decrease the viscosity of mucus. The cycle of mutually reinforcing anxiety that arises between parents and the afflicted child can generally be interrupted by reassurance, by amelioration of the asthma with drugs, or by transferring the child to a hospital. The factors that lead to asthma are varied and complex. Asthma can be viewed as the response of certain individual to accumulated stress. The sources of stress vary from time to time and from individual to individual. A constitutional predisposition, probably genetically determined, must be assumed. Superimposed factors of infection, of physical or chemical irritation, of specific allergic response, or of emotional tension serve to activate the latent tendency. Appropriate long-term management must be guided by the relative importance of these factors operative in an individual child. The prognosis for asthma in children is generally good. For many children it is a temporary or infrequent disturbance that need not interfere with a normal life. Care should be taken that therapeutic regimens do not rob the asthmatic child of this opportunity. For the few in whom asthma becomes a chronic, disabling problem, attention to the emotional components of the illness are clearly indicated and usually require the services of a competent psychiatrist.—*J. A. M. A.*

BOOK REVIEWS

THE PATHOGENESIS OF POLIOMYELITIS. By Harold K. Faber, M.D. Illustrated. Pp. 157. Price $5.00. Springfield, Ill.: Charles C. Thomas, 1955.

This small volume is most informative, easy to read and to digest. The clinical and immunological implications of the pathogenesis of poliomyelitis as described by the author are clear and worthy of much thought. The invasion of the virus, the sites of multiplication of the virus, the significance of viremia, etc. are all briefly but nonetheless succinctly described. An extensive bibliography is some satisfaction to the student of the subject. The book is highly recommended. MICHAEL A. BRESCIA, M.D.

COMMUNITY PROGRAMS FOR MENTAL HEALTH. Edited by Ruth Kotinsky and Helen L. Witiner. Cloth. Pp. 362. Price $5.00. Cambridge, Mass.: Harvard University Press, 1955.

This book is recommended to administrators, physicians, nurses and persons who are in a key position and who may at times influence the lives of other people. The contributing authors have something to offer the reader. It may be a new concept, a planned program, or a method of survey. The trend in Mental Health Education appears the more dynamic and attempts to translate the mental health principals into professional practice. For the present, the very definition of mental health has serious difficulties. Our entire concept of mental and emotional health is being challenged. At present, we have no specific knowledge of the cause or mode of transmission of emotional and mental disorders. There has been little study done in the past on the changing attitudes that are more deeply rooted in the personality, such as attitudes toward parents, siblings, self and persons of differing culture. The failure to meet basic human needs may result in the development of maladjustments which will gradually increase the intensity of social and community problems. Of particular interest in the field of public health are the nine programs offered for the promotion of mental health. The newer projects emphasize the positive aspects as a basis for productive living. We no longer emphasize improving

facilities for treatment, or try to change the public attitude toward mental disease. Mental disorders are defined with the social norm and the values of the community in which the patient's symptoms are observed. E. MECHTA, R.N.

CLINICAL ABSTRACTS OF DIAGNOSIS AND TREATMENT (J.A.M.A.) Edited by Noah D. Fabricant, M.D. Cloth. Pp. 627. Price $5.50. New York: Grune & Stratton, Inc. 1955.

As the editor states in his preface, the medical literature of the world has become so voluminous that it is practically impossible to keep up with. Hence, abstracting journals and books have a definite place and furnish a great deal of capsule information. This book represents the first in a series of such publications. The index to the present volume is most inadequate and I might suggest that the future volumes contain a more detailed index and to make it a cumulative index if it is at all feasible. The practicability of all these abstracting volumes can be enhanced by a good index.

MICHAEL A. BRESCIA, M.D.

FEEDING YOUR BABY AND CHILD. By Benjamin Spock, M.D. and Miriam E. Lowenberg, Ph. D. Cloth. Pp. 226. Price $3.75. New York: Duell, Sloan and Pearce; Boston: Little, Brown and Company, 1955.

This book is intended as a guide to the expectant and new mother on how to properly feed herself during pregnancy and how to handle some of the problems of feeding the newborn and infant. The book is written simply and is easy to read; it might very well help some bewildered mother in the culinary arts for the infant. Preparation of formulas and suggested menus for the child are included. It seems to me that the authors do not emphasize sufficiently the importance of breast feeding the newborn. Although this type of feeding is stated to be the best type for the newborn, it seems to be merely so stated for completeness of the book rather than from firm conviction. The book would be enhanced by some illustrations. MICHAEL A. BRESCIA, M.D.

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